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10/616,611	07/10/2003	Morris D. Stillabower	DP-308655	3336

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DELPHI TECHNOLOGIES, INC.  
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EXAMINER

SEMENENKO, YURIY

ART UNIT	PAPER NUMBER
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2841

DATE MAILED: 07/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/616,611

Applicant(s)

STILLABOWER, MORRIS D.

Examiner

Yuriy Semenenko

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 10 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/28/2003 page 1.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities: there is not aperture 528 on Fig. 6, page 8, [0024].

Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
- 
- 2.1. Claims 1-3, 5-9, 11, 15, 17-24, 27, 31-34, 36 are rejected under 35U.S.C. 103(a) as being obvious over R. Wannamaker (SIR, Reg. Number: H921) hereinafter Wannamaker in view of Applicant's own admission of prior art hereinafter Applicant.

2.1.1. Regarding claim 1: Wannemacher discloses in Fig. 1. a circuit assembly comprising a substrate 11 and a surface-mount device 17 mounted thereto, multiple electrically-conductive pads 14 and 15 present on at least one device attachment region 21 and 22 of the substrate, and solder joints bonding the surface-mount device to the pads ( column 3, lines 41-44), the substrate having at least one aperture 16 formed therein that is located and configured so as to cause at least a portion of the at least one device attachment region 21 and 22 to be more compliant than the second region of the substrate.

However, Wannemacher doesn't explicitly teach the at least one device attachment region and a second region of the substrate being formed of a first material and the surface-mount device comprising a package formed of a second material having a lower coefficient of thermal expansion than the first material.

Applicant discloses in the "Background of the invention" section (page 2, [0005]), at the time the invention was made, it was known to use the at least one device attachment region and a second region of the substrate being formed of a first material [organic substrates] and the surface-mount device comprising a package formed of a second material [the silicon or ceramic materials of SMT devices] having a lower coefficient of thermal expansion than the first material. But it is not conventional practice because of significant mismatch in coefficients of thermal expansion and as result big stress, developing in such structures . Wannemacher's invention overcame this problem by creating stress controlling mounting structures.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the at least one device attachment region and a second region of the substrate being formed of a first material and the surface-mount device comprising a package formed of a second material having a lower coefficient of thermal expansion than the first material.

Benefit of doing so is to lower cost of such assembly.

2.1.2. Regarding claim 2: Wannemacher discloses in Fig. 3. a circuit assembly according to claim 1, wherein the at least one aperture comprises first 36 and second apertures 39, the first and second apertures delineate first and second compliant members 30 and 31, respectively within the at the least one device attachment region of the substrate, and at least some of the pads 34, 35 are located on the first and second compliant members.

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2.1.3. Regarding claim 3: Wannemacher discloses in Fig. 3. a circuit assembly according to claim 2, wherein each of the first 36 and second 39 apertures is U-shaped in the plane of the substrate.

2.1.4. Regarding claim 5: Wannemacher discloses in Fig. 3. a circuit assembly having all of the claimed features as discussed above with respect claim 2., wherein the first 30 and second 31 compliant members have peripheral borders delineated by the first and second apertures, respectively, and each of the first and second compliant members has a boundary that is not delineated by the first and second apertures.

2.1.5. Regarding claim 6: Wannemacher discloses in Fig. 3. a circuit assembly according to claim 5, wherein the boundaries of the first 36 and second 39 compliant members face each other so that a central region of the at least one device attachment region is between the first and second compliant members.[consider all area between aperture 36 and aperture 39 as a central region of the one device attachment region].

2.1.6. Regarding claims 7, 32: Wannemacher discloses in Fig. 3 the circuit assembly according to claim 6 (31), further comprising a third aperture 37 in the central region of the at least one device attachment region.

2.1.7. Regarding claims 8, 33: Wannemacher discloses in Fig. 4 the circuit assembly according to claim 7 (32), wherein the third aperture 37 extends into each of the first 30 and second 31 compliant members separated by the central region.

2.1.8. Regarding claims 9, 34: Wannemacher discloses in Fig. 4 the circuit assembly according to claim 7 (32), wherein the third aperture has a substantially rectilinear shape in the plane of the substrate.

2.1.9. Regarding claims 11(36): Wannemacher discloses in Fig. 3 the circuit assembly according to claim 2 (31), further comprising conductive runners 32 and 33 that electrically interconnect the pads 34 and 35 on the first 30 and second 31 compliant members to the second region of the substrate.

2.1.10. Regarding claim 15: Wannemacher discloses in Fig. 3 the circuit assembly according to claim 1, wherein the at least one aperture comprises multiple apertures, a first set of the multiple apertures 36 and 37 delineates a first compliant member 30 within the at the least one device attachment region of the substrate, a second set of the multiple apertures 38 and 39 delineates a

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second compliant member 31 within the at the least one device attachment region of the substrate, and at least some of the pads 34 and 35 are located on the first and second compliant members.

2.1.11. Regarding claim 17: Wannemacher discloses in Fig. 3 the circuit assembly according to claim 15, wherein a central region is defined by and between the first and second compliant members within the at least one device attachment region.

2.1.12. Regarding claim 18: Wannemacher discloses in Fig. 1 the circuit assembly according to claim 15, further comprising at least one central aperture 16 in the central region of the at least one device attachment region.

2.1.13. Regarding claim 19: Wannemacher discloses in Fig. 4 the circuit assembly according to claim 1, wherein the at least one aperture 56 comprises at least three apertures aligned in a row, first and second apertures of the at least three apertures (see Fig. 4 below) are adjacent and delineate a first compliant member 57 therebetween within the at the least one device 17 attachment region of the substrate 11, the second aperture and a third aperture (see Fig. 4 below) of the at least three apertures are adjacent and delineate a second compliant member 58 therebetween within the at the least one device attachment region of the substrate, and at least some of the pads 54 and 55 are located on the first and second compliant members.

2.1.14. Regarding claim 20: Wannemacher discloses in Fig. 4 the circuit assembly according to claim 19, wherein each of the at least three apertures is oblong-shaped in the plane of the substrate and in a direction transverse to a direction in which the first, second and third apertures are aligned. Although Wannemacher doesn't teach in Fig. 4 that each of the at least three apertures is discrete, Wannemacher does teach in Fig. 3 each of the at least three apertures 36, 37, 38 and 39 are discrete. At time the invention was made, it was well know to use discrete apertures in the plane of the substrate.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention to make each of the at least three apertures as discrete elements in the plane of the substrate and in a direction transverse to a direction in which the first, second and third apertures are aligned.

Benefit of doing so is to keep substrate more durable.

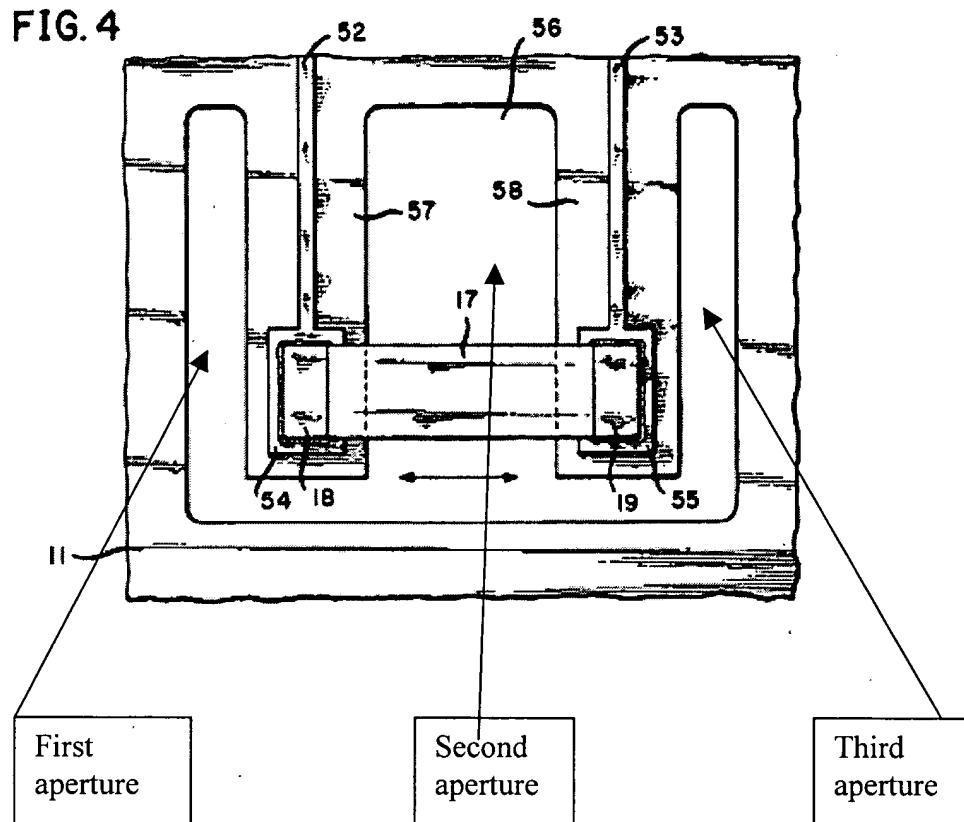


Fig. 4

2.1.15. Regarding claim 21: And further, Wannemacher discloses in Fig. 3 the circuit assembly according to claim 19, wherein each of the first 30 and second 31 compliant members has opposing peripheral borders delineated by the at least three apertures 36, 39, and each of the first

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and second compliant members has opposing boundaries that are not delineated by the at least three apertures so as to be contiguous with the second region of the substrate.

2.1.16. Regarding claim 22: And further, Wannemacher discloses in Fig. 4 the circuit assembly according to claim 21, wherein the first and second compliant members are separated by the second aperture (see Fig. 4 above).

2.1.17. Regarding claim 23: And further, Wannemacher discloses in Fig. 4 the circuit assembly according to claim 22. Although Wannemacher doesn't teach in Fig. 4 the first, second and third apertures are substantially equal in shape and size, Wannemacher does teach in Fig. 3 each first, second and third apertures are substantially equal in shape and size. At time the invention was made, it was well known to use the first, second and third apertures are substantially equal in shape and size.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention wherein the first, second and third apertures are substantially equal in shape and size.

Benefit of doing so is to simplify manufacturing process of the substrate.

2.1.18. Regarding claim 24: And further, Wannemacher discloses in Fig. 4 (see above) the circuit assembly according to claim 22, wherein the first, second and third apertures are substantially equal in shape, the first and third apertures are substantially equal in size, and the second aperture is wider than the first and third apertures in a direction in which the first, second and third apertures are aligned.

2.1.19. Regarding claim 27: Wannemacher discloses in Fig. 3 the circuit assembly according to claim 19, further comprising conductive runners 32 and 33 that electrically interconnect the pads 34 and 35 on the first 30 and second 31 compliant members to the second region of the substrate.

2.2. Claims 4, 10, 16, 35 are rejected under 35 U.S.C. 103(a) as being obvious over Wannemacher in view of Applicant in further view of D. Edwards et al. (Patent # 6064576) hereinafter Edwards.

2.2.1. Regarding claim 4: Wannemacher discloses a circuit assembly having all of the claimed features as discussed above with respect claim 2.



However, Wannemacher doesn't explicitly teach the first and second apertures is C-shaped in the plane of the substrate.

Edwards discloses in Fig. 5 aperture 36 is C-shaped in the plane of the substrate. At time the invention was made, it was well know to use the apertures with C-shaped in the plane of the substrate.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the the first and second apertures is C-shaped in the plane of the substrate.

Benefit of doing so is to decrease number of a center of concentration of stresses.

2.2.2. Regarding claims 10, 35: Wannemacher discloses a circuit assembly according to claim 7 (32),

However, Wannemacher doesn't explicitly teach the third aperture has a substantially circular shape in the plane of the substrate.

Edwards discloses in Fig. 4 aperture 36 has a substantially circular shape in the plane of the substrate. At time the invention was made, it was well know to use the aperture with a substantially circular shape in the plane of the substrate.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the third aperture has a substantially circular shape in the plane of the substrate.

Benefit of doing so is to decrease stress in central region.

2.2.3. Regarding claim 16: And further, Wannemacher discloses in Fig. 3 the circuit assembly according to claim 15, wherein each of the multiple apertures is discrete and circular-shaped in the plane of the substrate.

2.3. Claims 12, 13, 37 are rejected under 35U.S.C. 103(a) as being obvious over Wannamaker in view of Applicant in further view of D. Busch et al. (Patent # DE 4424984) hereinafter Busch.

2.3.1. Regarding claims 12, 37: Wannemacher discloses a circuit assembly having all of the claimed features as discussed above with respect claim 11 (36).

However, Wannemacher doesn't explicitly teach at least one of the conductive runners extends along a surface of the substrate between the first and second apertures.

Busch discloses in Fig. 2. the circuit assembly 1 wherein at least one of the conductive runners 11 extends along a surface of the substrate between the first 7 and second 7 apertures. At time the invention was made, it was well know to use the conductive runners extending along a surface of the substrate between the first and second apertures.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention at least one of the conductive runners extends along a surface of the substrate between the first and second apertures.

Benefit of doing so is to save space for added traces of the substrate.

2.3.2. Regarding claim 13: Further, Wannemacher discloses a circuit assembly according to claim 11.

However, Wannemacher doesn't explicitly teach at least one of the conductive runners extends along an edge of one of the first and second apertures.

Busch discloses in Fig. 2. one of the conductive runners 11 extends along an edge 8, 9 of one of the first and second apertures. At time the invention was made, it was well know to use the conductive runners extends along an edge of one of the first and second apertures.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention at least one of the conductive runners extends along an edge of one of the first and second apertures.

Benefit of doing so is to reach more density of traces of the substrate.

2.4. Claims 14, 39 are rejected under 35U.S.C. 103(a) as being obvious over Wannamaker in view of Applicant in further view of A. ElHatem et al. (Patent # 5699231) hereinafter ElHatem.

2.4.1. Regarding claims 14, 39: Wannemacher discloses a circuit assembly having all of the claimed features as discussed above with respect claim 2 (39).

However, Wannemacher doesn't explicitly teach, the first and second aperture's are filled with an electrically-nonconductive material that differs from the first and second materials. ElHatem discloses(column 3,lines 64-66 and column 4, lines 1-7) the first and second aperture's are filled with an electrically-nonconductive material that differs from the first and second

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materials. At time the invention was made, it was well know to use material that differs from the first and second materials to fill with an electrically-nonconductive material the first and second aperture's.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the first and second aperture's are filled with an electrically-nonconductive material that differs from the first and second materials to provide more stability to such structure.

2.5. Claims 25, 26 are rejected under 35U.S.C. 103(a) as being obvious over Wannamaker in view of D. Corisis et al. (Patent # 6894372) hereinafter Corisis.

2.5.1. Regarding claim 25: Wannemacher discloses in Fig. 3 the circuit assembly according to claim 22, wherein the first 36 and second apertures 39 are U-shaped in the plane of the substrate so that the peripheral borders of the first and second compliant members are U-shaped in the plane of the substrate. Although Wannemacher doesn't teach the boundaries of the first and second compliant members face the third aperture, and the third aperture has two oppositely-disposed U-shaped edges facing the first and second apertures.

Corisis teaches a lot of different shapes of aperture (Fig. 3-11). At time the invention was made, it was well know to use the third aperture has two oppositely-disposed U-shaped edges facing the first and second apertures.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the boundaries of the first and second compliant members face the third aperture, and the third aperture has two oppositely-disposed U-shaped edges facing the first and second apertures to provide better condition for soder joints of surface-mount device.

2.5.2. Regarding claim 26: And further, Wannemacher discloses in Fig. 4 (see above) the circuit assembly according to claim 25, wherein the first and second apertures are substantially equal in shape and size, and the third aperture is wider than the first and second apertures in a direction in which the first, second and third apertures are aligned.

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2.6. Claims 28, 29, 30, 38 are rejected under 35U.S.C. 103(a) as being obvious over Wannamaker in view of E. Schahier (Patent # DE04325499) hereinafter Schahier.

2.6.1. Regarding claim 28: Wannemacher, as modified discloses the circuit assembly having all of the claimed features as discussed above with respect claim 1.

However, Wannemacher doesn't explicitly teach the at least one aperture comprises an S-shaped aperture, first and second portions of the S-shaped aperture delineate a first compliant member within the at the least one device attachment region of the substrate. the second portion and an adjacent third portion of the S-shaped aperture delineate a second compliant member within the at the least one device attachment region of the substrate, and at least some of the pads are located on the first and second compliant members.

Schahier discloses in Fig. 3. aperture comprises tongue-like aperture 34. Although shape of this aperture doesn't exactly the same as application's S-shaped aperture, but it is very close in shape to this aperture 34 and has all features claimed in claim 28. The first 33 and second 35 portions of the aperture delineate a first compliant member 24 (left) within the at the least one device attachment region of the substrate, the second portion and an adjacent third portion of the aperture delineate a second compliant member 24 (right) within the at the least one device attachment region of the substrate, and at least some of the pads 30 are located on the first and second compliant members. At time the invention was made, it was well know to use aperture comprises an S-shaped aperture.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the at least one aperture comprises an S-shaped aperture, first and second portions of the S-shaped aperture delineate a first compliant member within the at the least one device attachment region of the substrate, the second portion and an adjacent third portion of the S-shaped aperture delineate a second compliant member within the at the least one device attachment region of the substrate, and at least some of the pads are located on the first and second compliant members.

Benefit of doing so is to release stress in attachment region of the substrate.

2.6.2. Regarding claim 29: And further, Wannemacher, as modified, discloses the circuit assembly according to claim 28.

However, Wannemacher doesn't explicitly teach each of the first and second compliant members has peripheral borders delineated on three sides by the S-shaped aperture, and each of the first and second compliant members has a boundary that is not delineated by the S-shaped aperture so as to be contiguous with the second region of the substrate.

Schahier discloses in Fig. 3. each of the first and second compliant members 24 has peripheral borders 33 delineated on three sides by the S-shaped aperture 34, and each of the first and second compliant members 24 has a boundary that is not delineated by the S-shaped aperture so as to be contiguous with the second region of the substrate. At time the invention was made, it was well known to use aperture that is comprised of an S-shape.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention each of the first and second compliant members has peripheral borders delineated on three sides by the S-shaped aperture, and each of the first and second compliant members has a boundary that is not delineated by the S-shaped aperture so as to be contiguous with the second region of the substrate.

Benefit of doing so is to further release stress in attachment region of the substrate.

2.6.3. Regarding claim 30: And further, Wannemacher, as modified, discloses the circuit assembly according to claim 29.

However, Wannemacher doesn't explicitly teach the first and second compliant members are separated by the second portion of the S-shaped aperture.

Schahier discloses in Fig. 3. the first 24 (left) and second 24 (right) compliant members are separated by the second portion 36 of the S-shaped aperture 34. At time the invention was made, it was well known to use aperture comprises an S-shaped aperture.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the first and second compliant members are separated by the second portion of the S-shaped aperture.

Benefit of doing so is to release stress in attachment region of the substrate.

2.6.4. Regarding claim 38: And further, Wannemacher, as modified, discloses in Fig. 3 the circuit assembly 11 according to claim 36, wherein each of the first 36 and second slots 39 has an outward edge facing away from the device attachment region and an inward edge facing the

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device attachment region and delineating the peripheral border of its respective first 30 or second 31 compliant member.

However, Wannemacher doesn't explicitly teach the conductive runners extend toward the outward edges of the first and second slots, continuously follow the outward edges and then the inward edges of the first and second slots, and finally extend to the pads on the first and second compliant members.

Schahier discloses in Fig. 3 the conductive runners extend toward the outward edges of the first and second slots, continuously follow the outward edges and then the inward edges of the first and second slots, and finally extend to the pads on the first and second compliant members. At time the invention was made, it was well known to use the conductive runners extend toward the outward edges of the first and second slots, continuously follow the outward edges and then the inward edges of the first and second slots, and finally extend to the pads on the first and second compliant members.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the conductive runners extend toward the outward edges of the first and second slots, continuously follow the outward edges and then the inward edges of the first and second slots, and finally extend to the pads on the first and second compliant members.

Benefit of doing so is to increase density of traces of the substrate.

2.7. Claim 31 is rejected under 35 U.S.C. 103(a) as being obvious over Wannamaker in view of Applicant's own admission of prior art.

2.7.1. Regarding claim 31: Wannemacher discloses in Fig. 3, a circuit assembly comprising: a substrate 11 formed of a first material and comprising a device attachment region and a second region outside the device attachment region; first 36 and second 39 slots formed in the substrate 11 so as to be separated by the device attachment region, the first and second slots being substantially U-shaped in the plane of the substrate and delineating first 30 and second 31 compliant members, respectively, within the device attachment region, the first and second compliant members having oppositely-disposed peripheral borders delineated by the first and second slots, respectively, the first and second compliant members having boundaries that are

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not delineated by the first and second slots and are spaced apart by a central region of the device attachment region between the first and second compliant members, the first and second compliant members being more compliant than the second region of the substrate; multiple electrically-conductive pads 34, 35 present on the first and second compliant members; a surface-mount device 17 mounted to the first and second compliant members; and solder joints 18 and 19 bonding the surface-mount device to the pads 34 and 35.

However, Wannemacher doesn't explicitly teach the surface-mount device comprising a chip formed of a second material having a lower coefficient of thermal expansion than the first material of the substrate.

Applicant discloses in the "Background of the invention" section (page 2, [0005]), at the time the invention was made, it was well known to use the surface-mount device comprising a chip formed of a second material [the silicon or ceramic materials of SMT devices] having a lower coefficient of thermal expansion than the first material of the substrate[organic substrates]. But it is not conventional practice because of significant mismatch in coefficients of thermal expansion and as result big stress, developing in such structures. Wannemacher's invention overcame this problem by creating stress controlling mounting structures.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Wannemacher to include in his invention the surface-mount device comprising a chip formed of a second material having a lower coefficient of thermal expansion than the first material of the substrate.

Benefit of doing so is to more durable surface-mount devices.

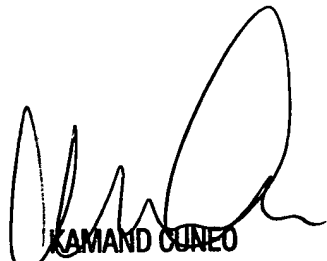
3.1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yuriy Semenenko whose telephone number is (571) 272-6106. The examiner can normally be reached on 8:30am - 5:00pm.

3.2. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571)- 272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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3.3. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YS



**KAMAND CUNEO**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**